or alternative donors (mismatched-related, haplo-identical and cord-blood, n = 27) performed in a single institution since 1/2001. GF was diagnosed in 25 patients (pts), cumulative incidence (CI) 5.2% (95%ci 3.5–7.6). GF was determined when ANC had not reached 0.5 × 10*9/L by day 21 (primary GF, n = 21) or when ANC decreased irreversibly after engraftment (secondary GF, n = 4). CI of GF was 2.5%, 6.8% and 23.4% after SCT from siblings, MUD or alternative donors, respectively ($p < 0.001$) but was similar following myeloablative or reduced-intensity conditioning (5.7% and 4.6%, respectively). Pts with a predominant donor population in chimerism testing were given donor cell boost with no additional conditioning (n = 10). Pts with a predominant host population were given autologous back-up cells (n = 8) or a second SCT from a different donor (sibling-1, haplo-3, MUD-1) with nonmyeloablative conditioning. 18 pts survived > 1 week after second graft infusion and are evaluable for engraftment. 16 pts engrafted within a median of 10 days (range, 5–15). The probability and pace of engraftment was similar in the different approaches. 11 pts (44%) were able to be discharged home and 14 died; 2 early after diagnosis of GF with no intervention, 5 within one week of second graft infusion and prior to engraftment, 2 with no engraftment and 5 early after engraftment from infection (n = 3), organ failure (n = 1) and GVHD (n = 1). With a median follow-up of 19 months (range, 3–68), 6 are alive and 5 additional pts died (relapse-3, GVHD-1, infection-1). The projected 2-year survival for all pts was 23% (95%ci 5–41). Interestingly, 4 pts given autologous cells had donor cell recovery, 1 had spontaneous autologous reconstitution within 3 weeks, 2 died within 2 months (GVHD-1, infection-1) with persistent donor cells and 1 remained complete donor until she relapsed 2 years later. In conclusion, treatment of GF with a chimerism directed method can salvage a subset of pts with GF. Reserving autologous and/or donor backup cells or an alternative donor is advisable in pts at high-risk of GF. The observation of allogeneic recovery after autologous boost is intriguing and of unknown mechanism.

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COMPARISON OF INCIDENCE OF SYSTEMIC VIRAL INFECTION (SVI) AND INVASIVE FUNGAL INFECTION (IFI) IN CHILDREN RECEIVING BUSULFAN BASED REDUCED INTENSITY ALLOGENEIC STEM CELL TRANSPLANT (RIAlloSCT) VS. MYELOABLATIVE AlloSCT (MA-AlloSCT) FOR MALIGNANT AND NON-MALIGNANT DISEASES

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We have previously demonstrated the safety and efficacy of RIAlloSCT in pediatric recipients (DelToro/Cairo et al, BMT, 2004; Bradley/Cairo et al, BMT, 2007). RIAlloSCT in adults is associated with a significant decrease in early bactermia (Junghanns et al, BBMT, 2002), but not in incidence of IFI or CMV (Fukuda et al, Blood 2003; Junghanns et al, Blood 2002). Date is lacking on incidence and timing of SVI and IFI in children undergoing RIAlloSCT. We compared the incidence of SVI and IFI in children receiving busulfan (BU)-based RIAlloSCT (group-A) vs. MA-AlloSCT (group-B) for various malignant and non-malignant diseases. Regimens in group-A were BU (6.4–8 mg/kg)/Fludarabine (FLU) (150–180 mg/m^2) ± ATG (n = 36) and regimens in group-B were BU (12.8–16 mg/kg)/FLU (150–180 mg/m^2) ± Alemtuzumab (n = 17) vs. MA regimen (group-B) consisting of BU (12.8–16 mg/kg)/Cyclophosphamide (120–200 mg/kg) or Melphalan (135 mg/m^2) ± ATG (n = 34). Median age: 7 yrs in group-A (0.5–21) and 4.5 yrs in group B (0.3–21), respectively. Stem cell source: UCB (group-A = 31, group-B = 20), PBSC (group-A = 18, group-B = 6), BM (group-A = 4, group-B = 8). Donor source: HLA-matched sibling (group-A = 14, group-B = 8), partially matched related (group-A = 3, group-B = 2), unrelated (group-A = 37, group-B = 24). GVHD prophylaxis consisted of tacrolimus/MMF for most patients (Osunkwo/Cairo et al, BBMT, 2004). CMV at risk recipients received ganciclovir/foscarnet (Shereck/Cairo et al, PBC, 2006) and most received antifungal prophylaxis with liposomal amphotericin B until day -100 (Roman/Cairo et al, PBC, 2007). Median follow-up: 782 days group-A/349 days group-B. Median time to myeloid engraftment: 19 days group-A & 20 days group-B. Incidence of aGVHD: 33% group-A/46% group-B. Incidence of cGVHD: 31% group-A/25% group-B. SVI were present in 27/53 pts (50%) in group-A and 22/34 pts (64%) in group-B (p=ns); Table-1. IFI were present in 5/53 pts (9.4%) in group-A, 5/34 pts (15%) in group-B (p=ns); Table-1. 3 pts died 1 of RSV pneumonitis in group-A and 1 each of invasive aspergillus in group- A and B, respectively. Incidence of mortality secondary to SVI and IFI was 2/53 pts (3.7%) group-A, 1/34 pts (2.9%) group-B. The estimated 1 yr OS was 77.7% (CI_{95}: 65.7–89.4) group-A and 63.8% (CI_{95}: 57.4–80.3, p=ns) group-B. While the incidence of SVI and IFI was similar in children undergoing RI vs. MA-AlloSCT, further analysis is required to determine the impact of RI conditioning on timing and mortality of SVI and IFI.

Infection	Group-A N = 53 (%)	Group-B N = 34 (%)
Adenovirus	5 (9.4)	2 (6)
CMV	5 (9.4)	5 (14)
EBV	0	0
RSV	10 (18)	6 (18)
Para-Influenza	4 (8)	5 (14)
Varicella	5 (9.4)	0
HSV	5 (9.4)	2 (6)
Influenza	2 (3.7)	2 (6)
BK-virus	7 (13)	9 (26)
Rota virus	4 (7.5)	2 (6)
Candida spp.	5 (9.4)	1 (3)
Asperigillus	3 (5.6)	0
Other fungii	1 (0.2)	1 (3)
Viral+fungal	14/31 (46)-UCB, 10/15 (62)-MRD, 4/7 (57)-MUD	12/20 (60)-UCB, 8/10 (70)-MRD, 4/4 (100)-MUD

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THE PREVALENCE AND DETERMINANTS OF THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE IN HEMATOPOIETIC STEM CELL TRANSPLANTATION PATIENTS

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Background: The aim of this study was to explore the use of complementary and alternative medicine (CAM) in hematopoietic stem cell transplantation (HSCT) patients. **Methods:** A descriptive survey design was developed. Data was collected through a descriptive questionnaire from 85 patients in outpatient HSCT clinic. Patients who underwent autologous or allogeneic stem cell transplantation for hematological malignancies and were at least 100 days post-transplantation were included in this study. **Results:** Seventy-two (55 male, 17 female) autologous and 13 (9 male, 4 female) allogeneic HSCT patients were included in the study. The median age was 46 (range; 19–80) and median period of time from the HSCT to evaluation was 24 months (range 4–86).

Thirty-six (42.4%) patients declared the use of some form of CAM.

Median age of CAM using patients was 36 (range; 19–80) while the others' was 50 (range; 23–69) (p = 0.14).

Patients treated with autologous HSCT reported more frequent use of some form of CAM than the allogeneic ones (45.8% vs. %23.1%) (p = 0.10).

Females (66.7% vs. 34.9%) (p = 0.01) and higher educated patients (52.9% vs. 26.5%) (p = 0.013) used CAM more frequently than the others. Married patients used CAM less frequently than the others (35.9% vs. 61.9%) (p = 0.01).

Herbal medicines and remedies were the most commonly used CAM therapies. Urtica Dioica, Nigella Sativa and grape seed were the most commonly used ones. The source of CAM-related information was mainly friends/family and the media. The majority used CAM to increase the body's ability to fight cancer or improve

physical and emotional well-being, and many declared that they felt a beneficial effect from the use of CAM. **Conclusions:** It is essential that health professionals explore the use of CAM among their cancer patients, educate them about potentially beneficial and proven therapies in light of the limited available evidence of effectiveness and potential side effects of CAM.

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PROSPECTIVE MONITORING OF NUTRITIONAL STATUS DURING THE EARLY PHASE AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Background: Currently recommended measures of parenteral nutrition (PN) after HSCT are often associated with hyperglycemia due to corticosteroids and calcineurin inhibitors, which increases the risk of infectious complications and mortality. This potential risk prevents the routine use of PN. In this study, we prospectively monitored caloric intake, changes in body compartment and biochemical indices, and assessed the correlation between these factors and clinical outcomes. **Methods:** Between April 2006 and August 2007, 76 patients received allogeneic HSCT in our institute. We excluded 16 patients due to progressive disease, graft failure and obvious fluid retention including engraftment syndrome, heart failure, renal failure and liver failure. The remaining 60 patients were categorized according to the mean caloric intake from the beginning of conditioning to day 56 or discharge: group 1 mean caloric intake was < basal energy expenditure (BEE, n = 17), group 2 1.0–1.3 × BEE (n = 34), and group 3 > 1.3 × BEE (n = 9). The median age was 49.5 years. There were no statistically significant differences in the proportion of conventional or reduced-intensity conditioning regimens among the 3 groups. Endpoints were changes in the actual resting energy expenditure (REE), body weight (BW) and other indicators of body compartments including muscle, fat and water weight, biochemical indices (total protein, albumin, pre-albumin and cholinesterase), clinical events including GVHD and infectious diseases, and length of hospital stay. **Results:** REE was within the range 1.0–1.2 × BEE in all 3 groups. In group 1, BW (7.5%), muscle (9.1%) and fat (10.8%) were significantly decreased, whereas no statistically significant loss of BW, muscle and fat was documented in group 2 or group 3. There was a significant correlation between weight loss and muscle loss ($r = 0.89$, $P < 0.001$), but no differences were found in the biochemical indices, or the incidences of GVHD and infectious diseases among the 3 groups. The length of the hospital stay after HSCT was significantly longer in group 1 compared with the other groups (74 vs 55 days, $P = 0.03$). **Conclusion:** Prospective monitoring revealed that low caloric intake was associated with a significant weight loss, muscle loss and longer length of hospitalization. Our data suggest that the patient's clinical outcome will be improved if the caloric intake during the early phase after allogeneic HSCT is maintained over 1.0 × BEE.

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CURRENT EPIDEMIOLOGY OF ORAL *CANDIDA* COLONIZATION IN PATIENTS WITH HEMATOLOGIC MALIGNANCIES UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION: A LONGITUDINAL, PROSPECTIVE STUDY

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Background: The epidemiology of yeast colonization and systemic infection in hematopoietic stem cell transplant (HSCT) recipients has changed substantially in recent years. Although *Candida albicans* remains the most common yeast pathogen, non-*albicans Candida* species are increasingly being encountered. The routine use of fluconazole and its successful use in preventing *C. albicans*-related colonization and infection have caused a shift to more resistant yeast species that represent a new clinical challenge. **Objective:** To follow the evolution of *Candida* oral colonization throughout HSCT therapy, employing fluconazole prophylaxis, in order to determine the current epidemiology of resistance to this agent. **Methods:** In a longitudinal, prospective study we evaluated a total of 55 patients with hematologic malignancies who underwent HSCT (46 autologous and 9 allogeneic) and received fungal prophylaxis with fluconazole 400 mg PO daily starting the first day of the conditioning regimen. Samples to assess oral *Candida* colonization were collected, using the swish and spit technique, prior to the start of fluconazole prophylaxis, on transplant day and on a weekly basis until hospital discharge. *Candida* species identification was performed via CHROMagar Candida and germ tube with confirmation using API-20C. MICs were determined using CLSI methodology by The University of Texas Health Science Center at San Antonio Fungus Testing Laboratory. Strain differentiation in selected patients was performed by PCR analysis of each isolate. **Results:** Oral colonization by *Candida* species was identified in 36 of 55 (65%) patients during the study period (Table 1). Thirty-two of 36 (89%) of these patients had a positive culture during the initial evaluation and 26 of 36 (81%) patients had more than one positive culture despite the use of fluconazole. Seven of 55 (13%) patients had mixed cultures. *Candida* species with reduced susceptibility or resistance to fluconazole were seen in 10 of 55 (18%) patients. **Conclusions:** Despite fungal prophylaxis with systemic fluconazole, oral colonization by *Candida* species remains common in HSCT recipients. Non-*Candida albicans* species with decreased susceptibility to fluconazole continue to emerge. These data suggest that a longitudinal surveillance with oral sampling, in patients undergoing HSCT, is a good mechanism to identify patients at risk for systemic infections with fluconazole resistant yeast, and should be further evaluated.

Table 1. *Oral fungal species associated with the HSCT*

Yeast Species	Total	Percent
Candida albicans	**25**	**57**
***Candida glabrata* ***	**12**	**27**
Candida tropicalis	**3**	**7**
***Candida dubliniensis* ***	**1**	**2**
Candida famata	**1**	**2**
***Candida krusei* ***	**1**	**2**
Candida parapsilosis	**1**	**2**
Saccharomyces cerevisiae	**1**	**2**

*Of the 10 patients with reduced susceptibility or resistance to fluconazole 8 were colonized by *C. glabrata*, 1 by *C. dubliniensis*, and 1 by *C. krusei* . Two of the 8 patients colonized by *C. glabrata* were colonized simultaneously by 2 different strains.

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THE POPSICKLE WITH STRAWBERRY AROMA REDUCES INFUSION-RELATED NAUSEA AND VOMITING DURING THE INFUSION OF CRYOPRESERVED PERIPHERAL BLOOD STEM CELLS

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Background: The aim of this study was to explore the effect of popsickle with strawberry aroma on the infusion-related toxicity of cryopreserved autologous peripheral blood stem cells (PBSC). **Methods:** We compared two groups of adult patients receiving popsickle with strawberry aroma during infusion or not to assess the incidences of adverse events occurring during infusion. All patients received granisetron 2 × 3 mg iv, lorezepam 6 × 1 mg po for prophylaxis of the nausea and vomiting during conditioning phase and infusion day. The patients had no evidence of nausea or vomiting prior to cryopreserved PBSC infusion. The patients with ongoing nausea or vomiting owing to conditioning regimens and/or receiving additional anti-emetics were excluded from the study. **Results:** Forty-five patients (median age 45, range; 17–75) were given popsickle with strawberry aroma during infusion and